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10/526,529	03/02/2005	Shridhar Mubaraq Mishra	1890-0205	5346

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EXAMINER	
ELPENORD, CANDAL	

ART UNIT	PAPER NUMBER
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,529	MISHRA ET AL.	
	Examiner	Art Unit	
	CANDAL ELPENORD	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-28* is/are pending in the application.

4a) Of the above claim(s) *12,13,15,19 and 22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-11, 14, 17-18, 20-21, 23-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *13 June 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 18, 2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claims 9-11, 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al (US 7,408,876 B1) in view of Burrows et al (US 7,383,574 B2).

Regarding claim 9, Gupta '876 discloses an arrangement in a data switch (fig. 2 to fig. 3, Packet Forwarding device comprising of plurality of ingress (elements 110) and egress queues (elements 112), col. 5, lines 65 to col. 6, lines 16) having at least one plurality of ingress ports (fig. 2 to fig. 3, see ingress ports 120 connecting to the egress ports 118 via the crossbar backplane 104, col. 5, lines 65 to col. 6, lines 47) and a plurality of egress ports (fig. 2 to fig. 3, see ingress ports 120 connecting to the egress ports 118 via the crossbar backplane 104, col. 5, lines 65 to col. 6, lines 47) connected by a switching fabric (fig. 2 to fig. 3, see the ingress and egress ports and ingress queue and egress queues to the crossbar backplane of router 100, col. 5, lines 65 to col. 6, lines 47), the arrangement comprising: at least one plurality of ingress queues (fig. 2 to fig. 3, see Ingress queues 110, col. 5, lines 65 to col. 6, lines 16) configured to queue data derived from data packets (noted: the ingress queues storing packets destined for the egress queue ports via the crossbar backplane, col. 3, lines 29-55, col. 6, lines 62-65) received at the ingress ports (fig. 2 to fig. 3, see ingress ports 120 connecting to the

egress ports 118 via the crossbar backplane 104, col. 5, lines 65 to col. 6, lines 47, noted: queuing of data packets received from other devices, col. 9, lines 52-58); a broadcast packet estimation unit to configured to determine the length (noted: the ingress queue manager using the messaging system (queuing thresholds) to scheduling of data packets, col. 6, lines 48-56, noted: the thresholds indicating the upper and lower queue sizes, col. 6, lines 57-65) of the at least one (fig. 2 to fig. 3, Ingress Queue 110) ingress queues (fig. 2 to fig. 3, see Ingress queues 110, col. 5, lines 65 to col. 6, lines 16); and a broadcast packet control unit having a broadcast storm control mode in which the broadcast packet control unit performs a broadcast storm control operation, the broadcast packet control unit configured to operate in broadcast storm control mode if the obtained measure of the length of the al least one ingress queue the rises above a first predetermined level before the data packets are queued in the at least one ingress queue, wherein the broadcast packet control unit is configured to only admit broadcast packets to the at least one ingress queue when not in broadcast storm control mode.

Regarding claim 10, Gupta '876 discloses the arrangement (fig. 2 to fig. 3, Packet Forwarding device comprising of plurality of ingress (elements 110) and egress queues (elements 112), col. 5, lines 65 to col. 6, lines 16), further comprising a plurality of ingress queues (fig. 2 to fig. 3, see Ingress queues 110, col. 5, lines 65 to col. 6, lines 16) wherein the broadcast packet estimation unit is configured to determine the length of the at least one ingress queue as the length of the longest of the ingress queues (noted: the ingress queue manager using the messaging system (queuing thresholds) to

scheduling of data packets, col. 6, lines 48-56, noted: the thresholds indicating the upper sizes of the queues, col. 6, lines 57-65).

Gupta '876 discloses all then claimed limitation with the exception of being silent with respect to claimed features: **Regarding claim 9**, and a broadcast packet control unit having a broadcast storm control mode in which the broadcast packet control unit performs a broadcast storm control operation, the broadcast packet control unit configured to operate in broadcast storm control mode if the obtained measure of the length of the al least one ingress queue the rises above a first predetermined level before the data packets are queued in the at least one ingress queue, wherein the broadcast packet control unit is configured to only admit broadcast packets to the at least one ingress queue when not in broadcast storm control mode.

Regarding claim 11, wherein the broadcast packet control unit is configured to perform the broadcast storm control by deleting at least some of the broadcast packets.

Regarding claim 14, wherein the broadcast packet control unit is configured to perform the broadcast storm control by deleting at least some of the broadcast packets.

However, Burrows '574 from the same field of endeavor discloses the above claimed features:

Regarding claim 9, and a broadcast packet control unit having a broadcast storm control mode in which the broadcast packet control unit performs a broadcast storm control operation (noted: fig. 2, fig. 4, the packet monitor with means for preventing broadcast storm, col. 4, lines 34-45, see, detecting undesirable traffic

patterns in the form of broadcast storms, col. 4, lines 46-53), the broadcast packet control unit configured to operate in broadcast storm control mode (noted: the packet monitors detecting broadcast storms and mitigating of undesirable traffic pattern, col. 5, lines 18-28, col. 11, lines 18-31) if the obtained measure of the length of the al least one ingress queue the rises above a first predetermined level before the data packets are queued in the at least one ingress queue (noted: the packet monitor using the packet monitor queues at the source to determine the occurrence of a broadcast storm if excess requests packets are received in flight, col. 11, lines 18-31, lines 51-58, col. 13, lines 58-64), wherein the broadcast packet control unit is configured to only admit broadcast packets to the at least one ingress queue when not in broadcast storm control mode (noted: not forwarding the packet in case of a broadcast storm, ceasing to forward of undesirable data packets, col. 5, lines 3-5, col. 8, lines 40-47).

Regarding claim 11, wherein the broadcast packet control unit (noted: fig. 2, fig. 4, the packet monitor with means for preventing broadcast storm, col. 4, lines 34-45, see, detecting undesirable traffic patterns in the form of broadcast storms, col. 4, lines 46-53) is configured to perform the broadcast storm control by deleting at least some of the broadcast packets (noted: the network traffic monitor determines all broadcast storm packets and means for disabled the source causing the broadcast storm using counters, col. 10, lines 53-63, noted: deletion of broadcast packets close to the source by the packet monitor, col. 13, lines 58-67).

Regarding claim 14, wherein the broadcast packet control unit (noted: fig. 2, fig. 4, the packet monitor with means for preventing broadcast storm, col. 4, lines 34-45,

see, detecting undesirable traffic patterns in the form of broadcast storms, col. 4, lines 46-53) is configured to perform the broadcast storm control by deleting at least some of the broadcast packets (noted: the network traffic monitor determines all broadcast storm packets and means for disabled the source causing the broadcast storm using counters, col. 10, lines 53-63, noted: deletion of broadcast packets close to the source by the packet monitor, col. 13, lines 58-67).

In view of the above, having the method for preventing congestion in the queues using backpressure messages from each respective ingress and egress manager of Gupta '876, and the well-established teachings of Burrows '574 for mitigating the undesirable pattern of broadcast storm, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Gupta '876 by incorporating the teaching features as taught by Burrows '574. The motivation for doing so would have been to prevent broadcast storms using the packet monitor queues as suggested in col. 4, lines 29-45.

6. **Claims 17-18, 20-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonomi et al (US 6,292,492 B1) in view of Bass et al (US 587,471 B1).

Regarding claim 17, Bonomi '492 discloses a method of operating a data switch ("switch using memory to buffer multicast cells", recited in col. 3, lines 48-63 and fig. 1, Switching arrangement, recited in col. 6, lines 52-61) having at least one of ingress ports (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42) and a plurality of egress ports (fig. 2, Output Ports 230-A-230-C, recited in col. 7, lines 35-42) connected

by a switching fabric (fig. 1, switching elements, recited in col. 6, lines 52-56 and "end-system switches", recited in col. 7, lines 1-12) , the switch (fig. 1, Switching arrangement, recited in col. 6, lines 52-61) having the at least one ingress of queues (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col. 7, lines 43-53) for queuing data derived from data packets ("buffered of cells", recited in col. 3, lines 48-52 and col. 7, lines 35-42) arriving at the ingress ports (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col. 7, lines 43-53, Ingress Ports 210-210-C) , the method comprising: deriving a measure ("traffic manager keeping track per connection of queue length", recited in col. 4, lines 9-15) of a length of the at least one of the queues ("queue length of connections", recited in col. 5, lines 62-67).

Regarding claim 18, Bonomi '492 discloses the method wherein there are a plurality of ingress ports (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42) and ingress queues (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col. 7, lines 43-53) and the measure of a length of the longest of the ingress queues ("longest branch queue", recited in col. 16, lines 38-59 and "congestion levels and increment of aggregate memory", recited in col. 16, lines 54-64) is used to obtain the measure of at least one ingress queue (noted: the traffic manager keeping track fro each respective port queue length, col. 4, lines 11-15, col. 5, lines 1-4, col. 5, lines 63-65).

Regarding claim 24, Bonomi '492 discloses the method wherein there are a plurality of ingress ports (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42) and ingress queues (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col.

7, lines 43-53) and the length ("queue length of connections", recited in col. 5, lines 62-67) of each of the plurality of ingress queues is summed to obtain the measure of the length of the at least one ingress queue ("sum of total memory storage and total memory space used by connections", recited in col. 11, lines 41-48 and col. 12, lines 3-7).

Regarding claim 17, a method of operating a data switch having at least one plurality of ingress ports and a plurality of egress ports connected by a switching fabric, the switch having at least one plurality of ingress queues for queuing data derived from data packets arriving at the ingress ports, the method comprising: deriving a measure of a length of the at least one queue and triggering a broadcast storm control mode in which broadcast storm control is performed before the data packets are queued in the at least one ingress queue according the measure of the length of the at least one ingress queue rises above a first predetermined level measure.

Bonomi '492 discloses all the claimed limitations with the exception of being silent with respect to claimed features:

Regarding claim 17, triggering a broadcast storm control mode in which broadcast storm control is performed before the data packets are queued in the at least one ingress queue according the measure of the length of the at least one ingress queue rises above a first predetermined level measure.

Regarding claim 20, the method, wherein the broadcast storm control is performed by deleting at least some of the broadcast packets.

Regarding claim 21, the method, further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a second predetermined level.

Regarding claim 23, the method, wherein the broadcast storm control is performed by deleting at least some of the broadcast packets.

However, Bass '471 from the same field of endeavor discloses the above claimed features:

Regarding claim 17, triggering a broadcast storm control mode (Noted: broadcast storms suppression when the class count of received messages has exceeded a threshold level, col. 5, lines 5, lines 34-65) in which broadcast storm control is performed before the data packets are queued in the at least one ingress queue according the measure of the length of the at least one ingress queue rises above a first predetermined level measure (noted: suppressing of message storms by discarding of the messages, col. 3, lines 30-39, col. 6, lines 29-38, noted: preventing the transmission of broadcast messages for particular class if the class counts reaches the predetermined threshold, col. 5, lines 33-58, noted: buffer overrun in the form of broadcast storms when multiple broadcast messages are being generated, col. 1, lines 25-43).

Regarding claim 20, the method, wherein the broadcast storm control is performed by deleting at least some of the broadcast packets (noted: selective discarding of broadcast messages if the threshold of the class count of the messages has exceeded the predetermined level, col. 3, lines 36-40).

Regarding claim 21, the method, further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a second predetermined level(noted: buffer overrun in the form of broadcast storms when multiple broadcast messages are being generated, col. 1, lines 25-43, noted: processing of the packets normally when the class count of the broadcast messages with respect to the thresholds not exceeding the predetermined levels, col. 7, lines 17-28, col. 8, lines 1-8).

Regarding claim 23, the method, wherein the broadcast storm control is performed by deleting at least some of the broadcast packets(noted: selective discarding of broadcast messages if the threshold of the class count of the messages has exceeded the predetermined level, col. 3, lines 36-40).

In view of the above, having the method for buffering multicast and unicast cells of multicast connections and determining the length of a respective queue of Bonomi "492, and the well-established teaching for suppressing broadcast storms in computer network of Bass '471, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Bonomi '492 by incorporating the teaching features of Bass '471 in order to provide selective suppression of broadcast storms as suggested in col. 2, lines 29-42.

7. **Claims 25-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonomi et al (US 6,292,492 B1) in view of Bass et al (US 6,587,471 B1).

Regarding claim 25, Bonomi '492 discloses a method of operating a data switch ("switch using memory to buffer multicast cells", recited in col. 3, lines 48-63 and fig. 1, Switching arrangement, recited in col. 6, lines 52-61) having at least one of ingress ports (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42) and a plurality of egress ports (fig. 2, Output Ports 230-A-230-C, recited in col. 7, lines 35-42) connected by a switching fabric (fig. 1, switching elements, recited in col. 6, lines 52-56 and "end-system switches", recited in col. 7, lines 1-12), the switch having a plurality of ingress queues (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col. 7, lines 43-53) for queuing data derived from data packets ("buffered cells", recited in col. 3, lines 48-52 and col. 7, lines 35-42) arriving at the ingress ports (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42), the method comprising: a) deriving a measure ("traffic manager keeping track of connection of queue length", recited in col. 4, lines 9-15) of a length of the at least one queue ("queue length of connections", recited in col. 5, lines 62-67).

Regarding claim 26, Bonomi '492 discloses the method wherein there are a plurality of ingress port (fig. 2, Input ports 210-A-210-C, recited in col. 7, lines 35-42) and ingress queues (fig. 2, Queue 250 or plurality of queues 220-A-220-Z, recited in col. 7, lines 43-53) and the length of the longest of the plurality of ingress queues is used as the length of the at least one ingress queue ("longest branch queue", recited in col. 16, lines 38-59).

Bonomi '492 discloses all the claimed limitations with the exception of being silent with respect to claimed features:

Regarding claims 25, deleting at least some of the broadcast packets before admission to the ingress queue if the measure of the length of the at least one ingress queue rises above a first predetermined level measure.

Regarding claim 27, the method further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a predetermined level.

Regarding claim 28, the method, further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a predetermined level.

However, Bass '471 from the same field of endeavor discloses the above claimed features:

Regarding claims 25, deleting at least some of the broadcast packets before admission to the ingress queue (noted: suppressing of message storms by discarding of the messages, col. 3, lines 30-39, col. 6, lines 29-38, noted: preventing the transmission of broadcast messages for particular class if the class counts reaches the predetermined threshold, col. 5, lines 33-58) if the measure of the length of the at least one ingress queue rises above a first predetermined level measure (noted: buffer overrun in the form of broadcast storms when multiple broadcast messages are being generated, col. 1, lines 25-43).

Regarding claim 27, the method further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a predetermined level (noted: buffer overrun in the form of broadcast storms when

multiple broadcast messages are being generated, col. 1, lines 25-43, noted: processing of the packets normally when the class count of the broadcast messages is not respect the thresholds not exceeding the predetermined levels, col. 7, lines 17-28, col. 8, lines 1-8).

Regarding claim 28, the method, further including a step of ceasing to delete packets when the measure of the length of the at least one ingress queue falls below a predetermined level (noted: buffer overrun in the form of broadcast storms when multiple broadcast messages are being generated, col. 1, lines 25-43, noted: processing of the packets normally when the class count of the broadcast messages is not respect the thresholds not exceeding the predetermined levels, col. 7, lines 17-28, col. 8, lines 1-8).

In view of the above, having the method for buffering multicast and unicast cells of multicast connections and determining the length of a respective queue of Bonomi "492, and the well-established teaching for suppressing broadcast storms in computer network of Bass '471, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Bonomi '492 by incorporating the teaching features of Bass '471 in order to provide selective suppression of broadcast storms as suggested in col. 2, lines 29-42.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Valdevit et al (US 5,636,345).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CANDAL ELPENORD whose telephone number is (571)270-3123. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Candal Elpenord/
Examiner, Art Unit 2616

/Aung S. Moe/

Supervisory Patent Examiner, Art Unit 2616